

Inspection Report
January 10, 1978

Confidential Claim Retracted

Authorized by: SC

Date: 6/29/13

Jackpile-Paguete Minesite
The Anaconda Company
Laguna Tribal Uranium Leases 1 and 4
Laguna Indian Reservation
Valencia County, New Mexico

U.S. Geological Survey
Conservation Division
P.O. Box 26124
Albuquerque, New Mexico 87125

Dale C. Jones
Mining Engineer
February 28, 1978



9404496

CONFIDENTIAL

POL-EPA01-0006621

January 10, 1978, The Anaconda Company's uranium exploration drilling operations within Laguna Tribal Uranium Lease 4 were inspected by the writer in the company of Ernie Wylie, Ron Beck, and Ike Peacock of Anaconda. This inspection was conducted as a followup to the September 29, 1977, examination of the same drilling operations when it was learned that boreholes drilled over the past several years had not been abandoned according to USGS requirements. The primary purpose of this inspection was to determine the extent and condition of these boreholes and to determine how to insure the proper abandonment of such holes.

Boreholes located in open-pit mining areas do not require permanent plugging because the entire hole columns are removed during the mining process; however, temporary plugging of these holes is recommended, especially in areas where livestock are present, if the open-pit mining will not occur for some time. On the other hand, boreholes in underground mining areas do require permanent plugging since only the subsurface ore zone portions of these holes will be removed. The remaining hole collars and columns create livestock hazards and could possibly allow surface runoff to enter the underground mine workings.

The subject drilling operations have been and are being conducted in the P-7, P-10, P-15, and P-17 areas to delineate uranium ore bodies that will be extracted by underground mining, and permanent plugging of the resulting boreholes is therefore imperative. Anaconda was so informed during the September 1977 inspection, and arrangements are now being made to have the recently drilled holes abandoned according to the requirements of the USGS and New Mexico State Engineer. The abandonment of boreholes drilled prior to September 1977 was left unresolved pending further inspection and review.

According to Anaconda, the surface drilling operations in these areas began in 1968, and the completed boreholes were then being plugged with cuttings and rocks. This practice was probably accepted by the USGS at that time. A crash drilling program was initiated later in 1968. The plugging operations could not keep up with the drilling and were evidently discontinued shortly thereafter. Although the exact number of holes left unplugged is not known, it is estimated to be significant because many holes in these areas have been drilled on 100- to 50-foot centers.

It was originally believed that most of the older, unplugged holes would have bridged a short distance below the collar, thereby precluding any significant cratering of the hole at the surface. This seems to be untrue as all of the open holes examined during the inspection seemed to be open through most, if not all, of their depth. Ron Beck pointed out that he had observed two boreholes in

the P-10 underground mine workings that were open to the surface, but he added that these two holes were probably only 1 to 2 years old. During the inspection, it was also observed that some holes have been covered up by subsequent surface disturbance and that some of the old drill sites were not reclaimed satisfactorily.

As a result of the inspection, it appears that the two main areas of concern are "how to plug these older boreholes" and "how to locate the boreholes that need to be plugged." Since no significant amounts of ground water have been encountered in the drilling operations, satisfactory plugging of the older holes can be accomplished by filling each hole as much as possible with any remaining drill cuttings and then placing a concrete plug in the hole from the collar to about 5 feet subsurface. This method would also be adequate for plugging the newly drilled boreholes, but Anaconda has decided to use drilling mud conforming to the State Engineer's requirements instead of drill cuttings to fill the hole columns. In addition, Anaconda plans to set some type of hole marker in the concrete plugs of the newer holes.

Locating the unplugged boreholes seems to be the most difficult problem and is further complicated by many of the older holes being buried by subsequent surface activities and/or being well concealed by new vegetation. Several procedures could be used to locate the older holes, each having its merits and disadvantages as detailed below.

1. The involved areas could be aerially photographed and the sites located from the resulting photographs. This method would undoubtedly be quite expensive, and open holes well concealed by vegetation could be missed.
2. The older holes could be located by surveying. Although this method would undoubtedly be very time consuming and possibly expensive, it would probably be the most effective means of locating all the suspect holes.
3. An organized, methodical field search could also be used to locate the suspect boreholes. This would also take a considerable amount of time, and such a search could still miss revegetated drill sites.
4. A random search, i.e., plugging the holes as they are located during the current drilling program, is another alternative location method and has been proposed by Anaconda. This method would probably be the cheapest and easiest, but the writer feels that many open holes could be missed, especially in areas where no further drilling is scheduled or presently in progress.

The USGS is not overly concerned with what method is used to locate the boreholes, but the USGS does want to insure that all boreholes in underground mining areas are satisfactorily plugged and also that the drill sites are all adequately conditioned for abandonment. This will involve coordination between the USGS and Anaconda as well as periodic field inspections, and future reports will document the results of the activities.

The writer later accompanied Erwin Green of Anaconda on an examination of the survey stations that have been established to detect and monitor possible surface subsidence resulting from the PW2-PW3 underground mining operations. The PW2-PW3 Mine Project, approved January 11, 1978, will be conducted as a small scam operation to retrieve about 35,000 tons of uranium ore on the northwest fringe of the mined-out North Paguate Pit within Laguna Tribal Uranium Lease 1. The involved ore bodies are located too close to State Highway 279 and the village of Paguate to be mined by open-pit methods.

The survey grid system consists of eight stations in the farthest northwestern area of the PW2-PW3 Project (see attached figure). Four of the stations are on 100-foot centers approximately 75 feet to the north of the centerline of Highway 279, and the other four stations are on the same centers about 75 feet south of the highway centerline. Each station consists of a concrete cylinder 6 inches in diameter and 18 inches in height which is placed in the ground with the top flush with the surface. A brass cap with a 3-inch shank has been placed flush with the top of each cylinder and bears the station number. Each station is surveyed every 3 months, and the results are submitted to the Area Mining Supervisor as soon thereafter as possible. The stations were surveyed twice prior to approval of the mining operations.


DALE C. JONES
Mining Engineer

Original to: Superintendent, Southern Pueblos Agency, BIA
cc: Governor, Pueblo of Laguna
Chief, Branch of Mining Operations, USGS
Through: Conservation Manager, Central Region, USGS
Files

LEASE BOUNDARY

P-W2 & PW-3 Surface Subsidence
Monitor Stations 992, 785E
1,008,050N

38-N

37-N

36-N

35-N

39-S

41-S

42-S

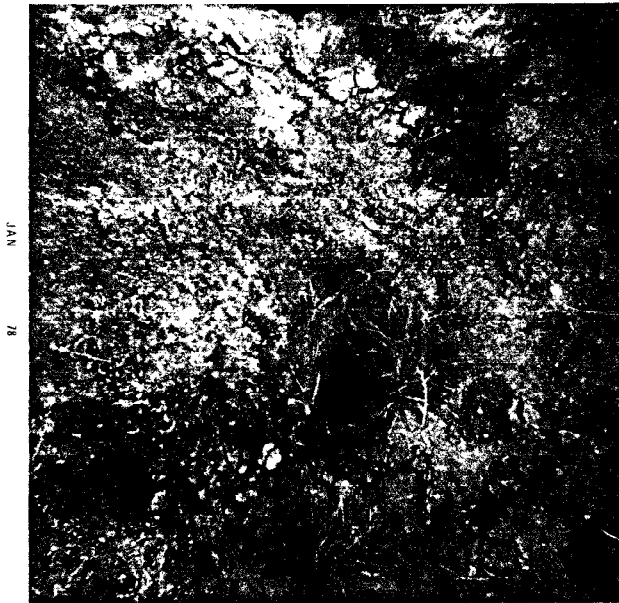
STATE HIGHWAY 279

NORTH PAGUATE PIT
MINED OUT AREA

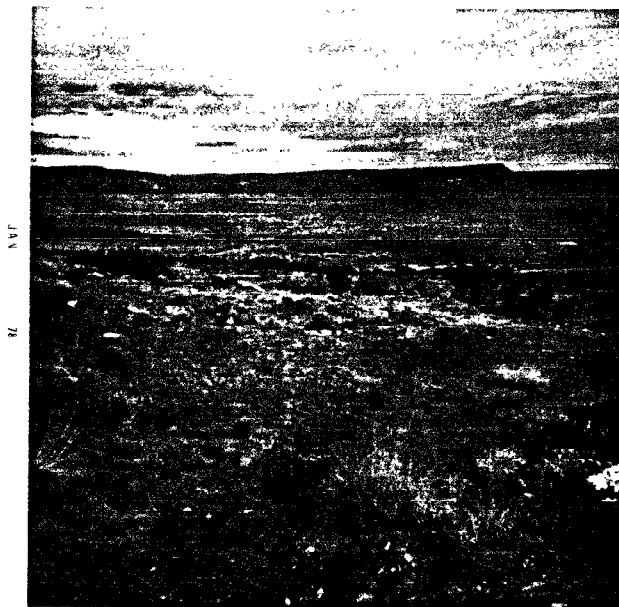
BREAK THROUGH FOR
VENTILATION

CONFIDENTIAL

POL-EPA01-0006625)NDA



Collar of open surface exploration drill hole in underground mining area on Black Mesa (hole approximately 5 inches in diameter).



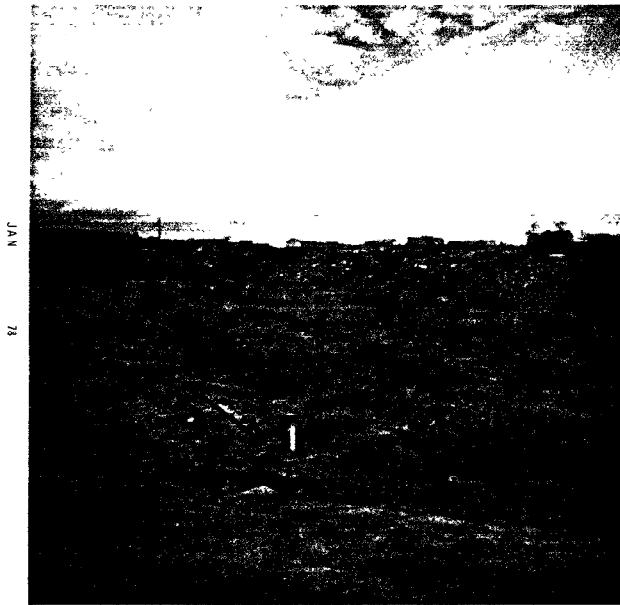
Surface area at drill hole location of photo above; gray drill cuttings visible in center of photo.



Old surface drill hole site in underground mining area on Black Mesa; gray drill cuttings visible in center of photo; drill hole was apparently buried by subsequent surface disturbance.



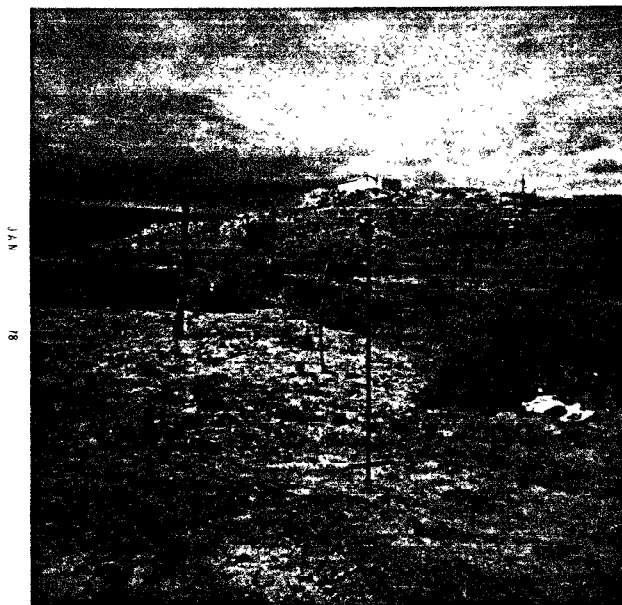
Old surface drill hole site in underground mining area on Black Mesa; gray drill cuttings visible in center of photo; open mud pit with black plastic lining visible in right-center of photo.



Subsidence monitoring station 38N (arrow) on northwest side of State Highway 279 to detect surface subsidence created by the PW2-PW3 underground mining operations; portion of village of Paguate visible in background above monitoring station.



Closeup of subsidence monitoring station 38N (photo above) showing concrete station with brass cap monument.



Subsidence monitoring station 36N (arrow) on northwest side of State Highway 279; portion of village of Paguate visible in background.



Closeup of subsidence monitoring station 36N (photo above).